

ACACIA MELVILLEI PEDLEY (MIMOSACEAE), A NEWLY-RECORDED LARVAL FOOD PLANT FOR JALMENUS EUBULUS MISKIN (LEPIDOPTERA: LYCAENIDAE)

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Abstract

Larvae of *Jalmenus eubulus* Miskin, 1876, have until recently, been considered monophagous, feeding exclusively on Brigalow, *Acacia harpophylla* F. Muell. ex Benth., unlike the closely-related and oligophagous *J. evagoras* (Donovan, 1805). Here we record a second food plant for *J. eubulus*, Yarran, *Acacia melvillei* Pedley. The solitary larvae feed on understory growth of *A. melvillei* and the adults occur in a habitat dominated by *A. melvillei*. It is recommended that the threatened conservation status of *J. eubulus* be retained.

Introduction

Jalmenus eubulus Miskin, 1876, was originally described as a distinct species but Waterhouse and Lyell (1914) considered it to be a northern, inland subspecies of *J. evagoras* (Donovan, 1805). Eastwood *et al.* (2008) returned *J. eubulus* to species rank and based differences in the two species on adult morphology, ecology, DNA, food plant and habitat. They also provided a review of synonymy and the type material of *J. eubulus*.

Whereas *J. evagoras* is distributed widely in the coastal and lower mountain regions of Victoria and eastern New South Wales and the coastal and subcoastal regions of southeastern Queensland (Waterhouse and Lyell 1914, Waterhouse 1932, Dunn and Dunn 1991, Braby 2000), *J. eubulus* occurs in a limited area of the dryer, inland brigalow belt in far northern New South Wales (Taylor 2014) and southern Queensland (Dunn and Dunn 1991, Orr and Kitching 2010, Eastwood *et al.* 2008, Braby and Williams 2016).

Jalmenus eubulus shows little variation in adult morphology throughout its range (Dunn and Dunn 1991), unlike the geographically variable *J. evagoras*, where adults of several northern and northwestern populations closely resemble *J. eubulus* (Common and Waterhouse 1981, Braby 2000). Eastwood *et al.* (2008) noted that populations from the Binjour Plateau, Krombit Tops, Toowoomba, Bunya Mountains and some more northern coastal areas have been considered to be *J. eubulus*, transitional or intermediate forms, a cline or a hybridisation zone between *J. eubulus* and *J. evagoras* (DeBaar 1977, Common and Waterhouse 1981, Dunn and Dunn 1991, Braby 2000, Sands and New 2002).

Although Waterhouse (1932) and McCubbin (1971) had suggested that, in addition to Brigalow (*Acacia harpophylla* F. Muell. ex Benth.), several other species of wattle served as food plants for *J. eubulus*, including *A. penninervis* Sieb. ex DC., *J. eubulus* was considered by Dunn *et al.*

(1994) and Eastwood *et al.* (2008), to be entirely dependent on mature stands of *A. harpophylla*. The solitary larvae of *J. eubulus* were said to feed only on *A. harpophylla* (Eastwood *et al.* 2008), whereas the gregarious larvae of *J. evagoras* were known to be oligophagous and to feed on at least 27 species of *Acacia* (Braby 2000).

Reports of *J. eubulus* ovipositing on an unidentified *Acacia* species, different from *A. harpophylla*, by Sands and New (2002), were not accepted by Eastwood *et al.* (2008) because identity of the host plant had not been confirmed and a subsequent search of the plant revealed no evidence of immature stages.

Dunn *et al.* (1994) and Yen and Butcher (1997) regarded the conservation status of *J. eubulus* as Vulnerable. After careful consideration, Sands and New (2002) recommended Vulnerable status for it in New South Wales and Lower Risk in Queensland, based on knowledge of the threatening processes pertaining at the time. Since then, several authors (Eastwood *et al.* 2008, Valentine and Johnson 2012, Braby and Williams 2016) have recognised the increasing threats to the mature brigalow habitats supporting *J. eubulus*, with Valentine and Johnson (2012) considering *J. eubulus* to be Endangered in Queensland and Critically Endangered in New South Wales.

Most authors, including Braby and Williams (2016), noted that *J. eubulus* was threatened due to its dependence on old growth *A. harpophylla* and that the decline in numbers was due to loss and destruction of the remnant breeding sites. *Jalmenus eubulus* is currently considered to be at risk from continuing habitat loss, invasion of the woodland habitats by highly-flammable Buffel grass (*Cenchrus echinatus* L.) and grazing of the lower branches of *Acacia* spp., the breeding sites for *J. eubulus*.



Figs 1-2. Habitat and breeding sites for *Jalmenus eubulus* in Qld: (1) mature stand of *Acacia melvillei* at Jondaryan; (2) mature stand of *A. harpophylla* near Goondiwindi.

Here, we confirm that a species of Yarran, *Acacia melvillei* Pedley (Fig. 1), is a food plant in addition to the previously known *A. harpophylla* (Fig. 2) for the larvae of *J. eubulus* in southern inland Queensland.

Field observations, food plants and habitats of *J. eubulus*

At Jondaryan and near Chinchilla, Queensland, oviposition (Fig. 3), larvae and pupae of *J. eubulus* were observed on the leaves among small stems of the understory growth of *A. melvillei*, while at Jondaryan larvae were sometimes observed feeding on growth sprouting from fallen trees. Males at Jondaryan (Fig. 4) were observed congregating at a height of about 7 m, near the apex of *A. melvillei* trees. The eggs, larvae and pupae of *J. eubulus* on *A. melvillei* were attended by an unidentified black ant (Fig. 5).



Figs 3-5. *Jalmenus eubulus* on *Acacia melvillei* at Jondaryan: (3) female ovipositing on understory growth; (4) freshly emerged male on understory growth; (5) fully-grown larva and freshly eclosed pupa, with attendant ants.

Yarran, *Acacia melvillei* (Fig. 1)

In Queensland, *A. melvillei* occurs mostly west of the Great Dividing Range: south of the Isaac River near Clermont, Charters Towers, Mitchell, Blackdown Tableland, Chinchilla, Jondaryan, Yaraka, west of Blackall (Lithgow 1997) and Thallon, near the New South Wales border. South of the Queensland-New South Wales border its inland distribution extends to Victoria. Pedley (1987) and Lithgow (1997) described the habit and growth of *A. melvillei* as a long-living tree reaching 15 m or more in height and with a trunk diameter to 30 cm, occurring often in groups of old growth trees on light soils and often in Poplar box (*Eucalyptus populnea* F. Muell.) woodlands. The yellowish, angular branchlets bear dark green oblong or elliptic phyllodes and the flowers are pale yellow to white.

Acacia melvillei is similar to a smaller species, *A. omalophylla* A. Cunn. ex Benth., both commonly referred to as Yarran and with an overlapping distribution in some areas. Whereas *A. melvillei* has yellowish green to greyish green phyllodes, the phyllodes of *A. omalophylla* are dull green to greyish green. *Acacia omalophylla* has not been observed to be a food plant for *Jalmenus eubulus*.

Brigalow, *Acacia harpophylla* (Fig. 2)

Acacia harpophylla forms a distinct plant community referred to as brigalow. It occurs in small patches in dryer regions of northern New South Wales and inland southern and central Queensland. Prior to clearing for agriculture, areas of brigalow were much more extensive than they are now (Eastwood *et al.* 2008). In Queensland, *A. harpophylla* occurs mostly, but not exclusively, west of the Main Divide from Hughenden to Rockhampton and from Clermont, Charleville, Dalby, Inglewood, Surat, Chinchilla and the Darling Downs to the New South Wales border. Remnant stands of brigalow also occur east of the Main Divide, for example, in the Brisbane Valley near Ipswich, Lockyer Valley at Gatton and near Boonah. In New South Wales, *A. harpophylla* is distributed from Boggabilla south-west to Bourke and south to Lake Cowal, 347 km west of Sydney.

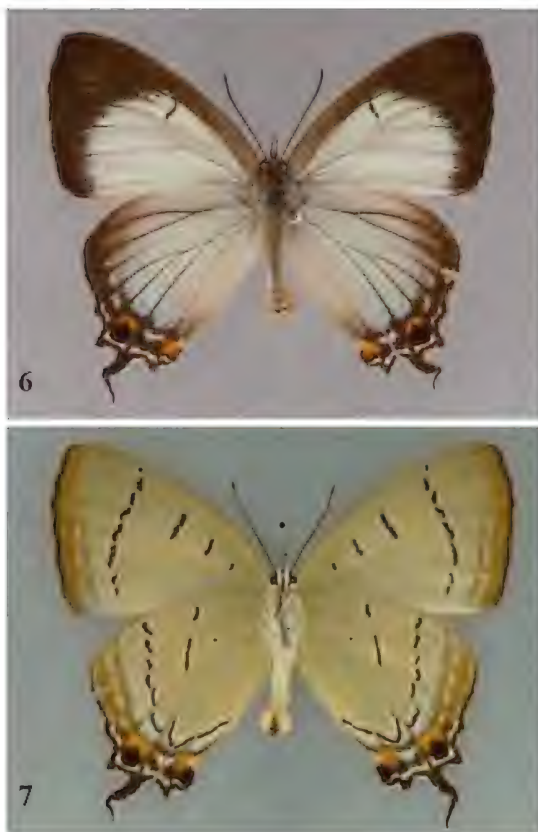
Lithgow (1997) described the habit and growth of *A. harpophylla* in the Chinchilla district as a long-living tree reaching to 20 m in height with a trunk diameter to 60 cm. Mature trees often occurred as old-growth stands and originally formed extensive areas of thick scrub. The ribbed and slender branches bear golden flowers. The phyllodes of *A. harpophylla* are sickle-shaped and vary in colour from dull green to silvery blue-green or silvery grey; the pods are long and slender.

Discussion

Acacia harpophylla is the best-known food plant for *J. eubulus* in the inland regions of far northern New South Wales (De Baar 1977, Taylor 2014) and in southern Queensland (Waterhouse 1932, McCubbin 1971, Common and Waterhouse 1981, Braby 2000, Eastwood *et al.* 2008, Braby and Williams

2016). Larvae and pupae of *J. eubulus* are usually solitary but occasionally occur in pairs. A larva and a pupa may be found close to one anther.

Jalmenus eubulus has been observed breeding on *A. harpophylla* at a range of locations in Queensland south of Eungella, including Mt Moffatt and Carnarvon Gorge (Monteith and Yeates 1988), Theodore, Chinchilla, western Darling Downs, Millmerran (Brietfuss and Hill 2003, J. Macqueen and JFR Kerr pers. comms), Leyburn, near Goondiwindi (DPA Sands unpubl.) and in parts of the far north of inland New South Wales south of Boggabilla (De Baar 1977, Taylor 2014).



Figs 6-7. *Jalmenus eubulus* male from Jondaryan: (6) upperside; (7) underside.

Adult specimens of *J. eubulus* from Jondaryan (Figs 6-7), where larvae were observed feeding (10.v.2010, 22.ii.2011 and 10.v.2016) at a study site only on *A. melvillei*, are identical to specimens from Millmerran and Chinchilla

reared from larvae feeding on *A. harpophylla*. At Jondaryan there are no mature stands of *A. harpophylla* near the breeding sites for *J. eubulus*. Larvae of *J. eubulus* have also been observed feeding (8.iv.2010) on *A. melvillei* south of Chinchilla, where *J. eubulus* uses both *A. harpophylla* and *A. melvillei* as hosts (DPA Sands pers. obs., Lithgow 1997: as '*Jalmenus* sp.'). At Chinchilla, both food plants have been observed with larvae on them within a few kilometres of one another. Variation in the colour of the phyllodes of *A. harpophylla* may have led to misidentifications of the food plants of *J. eubulus* in the past. For example, the phyllodes of *A. harpophylla* may appear silvery, blue-green or dark green and the latter colour forms superficially resemble the phyllodes of *A. melvillei*. However, the mature phyllodes of *A. melvillei* are considerably narrower than those of *A. harpophylla*.

Recognition of *A. melvillei* as a food plant for *J. eubulus* might explain some reports of *J. eubulus* ovipositing on another species of *Acacia* (Sands and New 2002). However, the records for *A. penninervis* (Waterhouse 1932, Common and Waterhouse 1981) remain unconfirmed. While *A. penninervis* var. *penninervis* occurs in the same inland regions of Queensland that support the two confirmed food plants of *J. eubulus* (*A. harpophylla* and *A. melvillei*), *A. penninervis* grows mainly on steep banks and on sandstone ridges (Lithgow 1997). The plant communities and the soil substrates associated with *A. penninervis* appear to be different from those of the 'old growth' and mature stands of *A. harpophylla* and *A. melvillei*, supporting the assertion by Eastwood *et al.* (2008) that *A. penninervis* is unlikely to be a larval food plant for *J. eubulus*.

There are very few localities where *J. eubulus* has been discovered breeding on *A. melvillei*. The uncommon mature stands of *A. melvillei* are unprotected and many are at risk of severe disturbance. On this food plant, *J. eubulus* is of conservation concern from clearing, weed invasion, fire, mining, grazing and other disturbances. It is unlikely that the discovery of *J. eubulus* breeding on *A. melvillei* will significantly alter the conservation status of *J. eubulus*.

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